Dakshit **Agrawal**

Fourth Year Undergraduate · Computer Science and Engineering

Indian Institute of Technology Roorkee

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Education

Indian Institute of Technology Roorkee — *Roorkee, India*

Bachelor of Technology, Major in Computer Science and Engineering — *2016 - 2020 (Expected)*

- CGPA: 9.371/10.00

Bansal Public School — *Kota, India*

Senior School (Grade 11 & 12) — *2014 - 2016*

- 94 % in Grade 12 Board Examinations, conducted by Central Board of Secondary Education, India

St. Johns Senior Secondary School — *Kota, India*

Secondary School (Grade 9 & 10) — *2012 - 2014*

- CGPA: 10.0/10.0 in Grade 10 Board Examinations, conducted by Central Board of Secondary Education, India

Publications

GAN-Tree: An Incrementally Learned Hierarchical Generative Framework for Multi-Modal Data Distributions

Jogendra Nath Kundu*, Maharshi Gor*, **Dakshit Agrawal**, R. Venkatesh Babu

Accepted for publication in ICCV 2019. Preprint available at **here**.

An Attention Model for Group-Level Emotion Recognition

Aarush Gupta*, **Dakshit Agrawal***, Hardik Chauhan, Jose Dolz, Marco Pedersoli

DOI: https://doi.org/10.1145/3242969.3264985. Aarush Gupta*, Dakshit Agrawal*, Hardik Chauhan, Jose Dolz, and Marco Pedersoli. 2018. An Attention Model for Group-Level Emotion Recognition. In 2018 International Conference on Multimodal Interaction (ICMI '18), October 16–20, 2018, Boulder, CO, USA. ACM, New York, NY, USA, 5 pages.

Internships

Carnegie Mellon University (CMU), Pittsburgh, USA

Research Internship, Advised by Prof. Katerina Fragkiadaki — *May 2019 - July 2019*

- Worked on learning trainable 3D visual representation for robot control.
- The whole code was written on Nvidia FleX, a simulator which runs completely on the GPU, hence decreasing sampling time of the replay buffers while training RL agents.

Indian Institute of Science (IISc), Bangalore, INDIA

Research Internship, Advised by Prof. R. Venkatesh Babu — *December 2018 - January 2019*

- Developed a top-down multi-generator model which use a hierarchical divisive strategy to address discontinuous multi-modal data.
- Developed novel mode splitting algorithm to effectively split the parent node to semantically cohesive children nodes, facilitating unsupervised clustering.
- Built multi-generator model such that incremental addition of new data modes to an already trained GAN-Tree is possible, by updating only a single branch of the tree structure.
- First top-down approach in the field of multi-generator models which does not require prior definition of the number of generators.

École de Technologie Superieure (ETS), Montreal, CANADA

Remote Research Internship, Advised by Prof. Marco Pedersoli and Prof. Jose Dolz — *May 2018 - July 2018*

- Developed an end-to-end model to learn scenic and facial features jointly using attention mechanisms for identifying the emotion portrayed by an image of a group of people **[Github Link]**.
- The model was submitted to ICMI 2018 EmotiW Group-Level Emotion Recognition Challenge and achieved **4th rank** among all participants. A short paper for the same was also accepted in the challenge.

International Experience

Interaction with Multi-Disciplinary Scientists and Visionaries Involved in Artificial Intelligence in JAPAN *Tsukuba & Tokyo, Japan*

Exploring AI in Japan *December 2017*

- Visited Japan to interact with scientists and gain exposure of the work culture with specific focus on the field of Artificial Intelligence **[report link]**.

Projects

Triplet-Loss VAE for Zero-Shot Learning *IIT Roorkee*

Undergraduate Project, Advised by Prof. Biplab Banerjee *January 2018 - April 2018*

- Developed a model for recognizing human actions in videos using zero-shot learning.
- Made a triplet deep metric loss Variational AutoEncoder (VAE) network to map the visual and semantic features onto a joint latent embedding space.

Unsupervised Human Action Detection in Videos *IIT Roorkee*

Undergraduate Project, Advised by Prof. Biplab Banerjee *August 2017 - January 2018*

- Implemented Spectral Clustering, using the Normalized Graph Cut Algorithm, for unsupervised clustering of video frames constituting similar human actions.
- Used Gaussian Mixture Models (GMM) and Conditional Random Fields (CRF) to incorporate temporal features of the frames into the clustering algorithm.

Trianglify *IIT Roorkee*

Android Project, Mobile Development Group (MDG) *March 2017 - May 2017*

- Developed an **Android library** that helps create views with beautiful patterns **[GitHub Link]**.
- Trianglify is based on MVP architecture.

Other Significant Projects

Some other significant projects are as follows:

- **Deep Learning - Tweet Sentiment Analysis:** Trained DL models to classify the sentiment of twitter tweets **[GitHub link]**.
- **Course Project - Survey Report on Open-Source Computing Hardware:** A project undertaken during the course CSN-221 Computer Architecture and Microprocessor. Prepared a survey report on open-source computing hardware which focused on hardware like Arduino, Raspberry Pi and BeagleBoard, their use cases, ground-level applications and future scope **[Report link]**.
- **Course Project - MultiLevel Feedback Queue Scheduling Algorithm:** A project undertaken during the course CSN-232 Operating Systems. Implemented the MLFQ job scheduling algorithm **[Report link]**.
- **Course Project - SIC-XE Assembler:** A project undertaken during the course CSN-252 System Software. Implemented a simple Assembler for SIC-XE language **[GitHub link]**.

Achievements

2019	**SN Bose Scholar**, Recipient of the SN Bose scholarship, which aims to nurture future innovators and thought leaders. Joint initiative by the Science & Engineering Board (**SERB**), Department of Science and Technology (**DST)**, **Govt. of India**, the Indo-U.S. Science and Technology Forum (**IUSSTF**) and **WINStep Forward**, developing a dynamic and transformative student exchange program between premier institutions in India and the United States **[link]**.	*India*
2016	**All India Rank 352**, JEE Advanced, rank out of 200,000 candidates.	*India*
2014	**KVPY Fellowship Awardee**, highly prestigious National Fellowship awarded by **Indian Institute of Science** and **Government of INDIA** to students who show high aptitude in research **[link]**.	*India*
2012	**NTSE Scholarship Awardee**, awarded by **Government of INDIA** to students who show high intellect and academic talent **[link]**.	*India*

Skills

Programming Languages Java, Python, C, C++
Operating Systems Windows, Linux
Utilities Pytorch, Keras, Tensorflow, Anaconda, Git, Android Studio

Teaching Experience

MAN - 001 *IIT Roorkee*

Undergraduate Teaching Assistant (UG TA) *October 2017 - November 2017*

- Worked as a teaching assistant of course MAN-001, a Mathematics course on Matrices and Calculus for first year students of IIT Roorkee.

Computer Camp 2017, 2018 *Birgunj, NEPAL*

Instructor *June 2017, 2018*

- Invited for two summers to instruct the computer camp held by GRADE Academy, Birgunj, NEPAL for students of Grade 1-5 on various topics of Computer Science.

NSS Prerna *IIT Roorkee*

Teacher *July 2016 - April 2017*

- One year of teaching experience as a Social Volunteer to students of Grade 4 - 10 in Maths and Science.

Extracurricular Activity

Vision and Language Group (VLG), ACM Student Chapter, IIT Roorkee *IIT Roorkee*

Core Member *July 2018 - PRESENT*

- Core member of VLG, a campus group that promotes **DL-centric research culture** in the campus by discussing deep learning research papers and working on related DL projects **[link]**.

ACM Student Chapter, IIT Roorkee *IIT Roorkee*

Treasurer *July 2019 - PRESENT*

- Treasurer of the student chapter of ACM at IIT Roorkee, which aims at uniting the computing fraternity at IIT Roorkee under one tag and allowing the students to learn together as well as share their knowledge to cater the interests of the individuals as well as the institute as a whole **[link]**.

Mobile Development Group (MDG) *IIT Roorkee*

Android Developer *January 2017 - PRESENT*

- Active member of MDG, a campus group that develops mobile apps and promotes **mobile app development** culture within the campus **[link]**.

References

Prof. Katerina Fragkiadaki *Pittsburgh, USA*

Assistant Professor, Machine Learning Department, Carnegie Mellon University

- **Email:** katef@cs.cmu.edu

Prof. Marco Pedersoli *Montreal, Canada*

Assistant Professor, École de technologie supérieure (ETS), Montreal

- **Email:** Marco.Pedersoli@etsmtl.ca

Prof. Biplab Banerjee *Bombay, India*

Assistant Professor, Centre of Studies in Resources Engineering, IIT Bombay

- **Email:** bbanerjee@iitb.ac.in

Dr. Ranita Biswas *Klosterneuburg, Austria*

Postdoctoral Researcher, Edelsbrunner Group, IST Austria

- **Email:** ranita.biswas@ist.ac.at